Claims

[c1]   1. A system for estimating an error in a first sensor, the system comprising:

a first sensor operable for generating a first signal;

a second sensor operable for generating a second signal;

a module communicatively coupled to the first sensor and the second sensor, wherein the module comprises a first portion operable for generating a first value based upon the first signal received from the first sensor, a second portion operable for generating a second value based upon the second signal received from the second sensor, and a third portion operable for combining the first value and the second value to generate a third value; and

an adaptive filter communicatively coupled to the module, the adaptive filter operable for receiving the first value and the third value and estimating the error in the first sensor based upon the first value and the third value.

[c2]   2. The system of claim 1, wherein the first sensor comprises a speed sensor.

[c3]   3. The system of claim 1, wherein the first sensor comprises a pitch sensor.

[c4]   4. The system of claim 1, wherein the second sensor comprises a differential global positioning system (DGPS).

[c5]   5. The system of claim 1, wherein the module comprises at least a portion of an integrated navigation system (INS).

[c6]   6. The system of claim 1, wherein the first, second, and third values comprise travel distance values.

[c7]   7. The system of claim 1, wherein the error comprises a scale factor.

[c8]   8. The system of claim 1, wherein the error comprises a bias factor.

[c9]

9. A system for estimating an error in a first sensor, the system comprising:

a first sensor operable for generating a first signal;

a differential global positioning system (DGPS) operable for generating a second signal;

a integrated navigation system (INS) communicatively coupled to the first sensor

and the DGPS, wherein the INS comprises a first portion operable for generating a first travel distance value based upon the first signal received from the first sensor, a second portion operable for generating a second travel distance value based upon the second signal received from the DGPS, and a third portion operable for combining the first travel distance value and the second travel distance value to generate a third travel distance value; and

an adaptive filter communicatively coupled to the INS, the adaptive filter operable for receiving the first travel distance value and the third travel distance value and estimating the error in the first sensor based upon the first travel distance value and the third travel distance value.

[c10]   10. The system of claim 9, wherein the first sensor comprises a speed sensor.

[c11]   11. The system of claim 9, wherein the first sensor comprises a pitch sensor.

[c12]   12. The system of claim 9, wherein the error comprises a scale factor.

[c13]   13. The system of claim 9, wherein the error comprises a bias factor.

[c14]   14. A method for estimating an error in a first sensor, the method comprising:
generating a first signal using the first sensor;
generating a second signal using a second sensor;
communicating the first signal and the second signal to a module coupled to the first sensor and the second sensor, wherein the module comprises a first portion operable for generating a first value based upon the first signal received from the first sensor, a second portion operable for generating a second value based upon the second signal received from the second sensor, and a third portion operable for combining the first value and the second value to generate a third value;
receiving the first value and the third value using an adaptive filter coupled to the module; and
estimating the error in the first sensor based upon the first value and the third value.

[c15]   15. The method of claim 14, further comprising selecting the first sensor to be a speed sensor.

[c16]   16. The method of claim 14, further comprising selecting the first sensor to be a pitch sensor.

[c17]   17. The method of claim 14, further comprising selecting the second sensor to be a differential global positioning system (DGPS).

[c18]   18. The method of claim 14, further comprising selecting the module to include at least a portion of an integrated navigation system (INS).

[c19]   19. The method of claim 14, further comprising selecting the first, second, and third values to be travel distance values.

[c20]   20. The method of claim 14, further comprising selecting the error to be a scale factor.

[c21]   21. The method of claim 14, further comprising selecting the error to be a bias factor.

[c22]   22. A method for performing a position calculation using an estimate of an error in a first sensor, the method comprising:
obtaining a plurality of signals from a second sensor during a first predetermined period of time;
estimating the error using a filter operable for receiving the plurality of signals during the first predetermined period of time, wherein the filter learns adaptively in a random manner;
storing the estimate of the error in a module communicatively coupled to the filter; and
utilizing the estimate of the error to perform a position calculation during a second predetermined period of time.

[c23]   23. The method of claim 22, further comprising selecting the second sensor to be a differential global positioning system (DGPS).

[c24]   24. The method of claim 23, wherein the first predetermined period of time comprises a period of unavailability of the DGPS.

[c25]   25. The method of claim 23, wherein the second predetermined period of time

comprises a period of availability of the DGPS.

[c26]   26. The method of claim 22, further comprising selecting the estimate of error
to be an estimate of a scale factor.

[c27]   27. The method of claim 22, further comprising selecting the estimate of error
to be an estimate of a bias factor.